

RESEARCH NOTES

Rocky Mountain Forest and Range Experiment Station

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PILOT TEST OF ETHYLENE DIBROMIDE IN AN OIL SOLUTION FOR CONTROL OF ROUNDHEADED PINE BEETLE, COCONINO NATIONAL FOREST -- 1956

by
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In May 1956, a small localized outbreak of the roundheaded pine beetle (Dendroctonus convexifrons Hopk.) in blackjack ponderosa pine was discovered in Oak Creek Canyon Recreation Area on the Sedona District of the Coconino National Forest in Arizona. The infestation threatened to mar the scenic values of one of the most highly prized recreation areas in the Southwest. The situation was appraised by personnel from the Albuquerque Forest Insect and Disease Laboratory, Rocky Mountain Forest and Range Experiment Station, and plans were made for a pilot control test.^{2/} The Albuquerque Laboratory furnished the technical assistance for the pilot test.

It has been shown experimentally that broods of roundheaded pine beetles can be successfully killed with a spray of ethylene dibromide in an oil solution.^{3/} Emulsions of ethylene dibromide were less satisfactory than the solution.

Field Procedures

Infested trees were marked for treatment several days in advance. A 100-percent survey was made of the outbreak area. Spot checks for infested trees were made in outlying forest campgrounds and residential areas. On a 14-acre area, 23 trees, mostly in the Pine Flat Forest Camp, were marked for treatment. Fading of infested trees was not evident when spraying was begun on June 20. Infested trees were recognized by the presence of pitch tubes and occasionally by frass at the base.

On June 20 and 25, 23 trees were sprayed. The ethylene dibromide oil formulation was mixed at the treating site. Formula used was 1 pound of ethylene dibromide in sufficient No. 1 fuel oil to make 5 gallons of solution. The spray was applied with a

^{1/} Acknowledgment is made to Ranger C. H. Olson, Coconino National Forest, for his aid on the project.

^{2/} Yasinski, F. M. Roundheaded pine beetle conditions, Coconino National Forest, Sedona District. Rocky Mountain Forest and Range Expt. Sta. 4 pp., 1956. [Typewritten.]

^{3/} Hay, Cyrus, J. Bark beetle studies, Lincoln National Forest, 1951. U. S. Bur. Ent. and Plant Quar., Forest Insect Lab., Ft. Collins, Colo. 17 pp., illus., March 20, 1952. [Typewritten.]

stirrup pump used with a 5-gallon Jeep can and a 20-foot hose attached to a 3-foot extension rod. Trees were felled before treating to reduce the possible hazard of excess insecticide falling on nearby campgrounds. Trees averaged 12 inches d.b.h. and could be easily rolled for complete coverage. The insecticide was applied until it ran off on all sides. Infestation extended to an average height of 12 feet.

A check on the effectiveness of the insecticide on the brood of the roundheaded pine beetle was made on July 11, 1956, approximately 2 weeks after treatment. No live insects were found.

On April 30, 1957, a 100-percent survey of a 50-acre area in and adjacent to the Pine Flat Forest Camp was made. Found on the survey were 6 trees infested in 1956 near the treated area and 3 trees infested in 1956 approximately 1 mile away. The currently infested trees -- all young pines except two -- were alone or in groups or two. Foliage of these trees showed no signs of fading. Infested blackjack pines were felled to see whether Ips had attacked the tops, but none were found there.

The 100-percent survey revealed that no infested trees were missed in the treatment of the Pine Flat Forest Camp area. However, where only spot checking was done, 2 trees infested in 1955 were missed and consequently not treated.

Discussion

The pilot test of ethylene dibromide in fuel oil for the control of roundheaded pine beetle was successful. The number of infested trees in the vicinity of the 1956 treating area was cut from 23 to 6, a reduction of approximately 75 percent. Past records reveal that such a reduction can be considered good control. Treating cost averaged \$5 a tree.

Spotting infested trees was the most difficult phase of the control project. Each tree had to be checked individually because fading from the 1955 attacks was not yet visible. It appears that trees most heavily hit or harboring large broods show little external evidence of infestation. The pitch tubes are inconspicuous and cannot usually be seen more than 2 feet from the tree. On a project of considerable size, spotting of infested trees before they begin to fade could become a difficult and costly task.

Limited research on the seasonal history of the roundheaded pine beetle showed that the beetle has a 1-year life cycle and emerges and attacks in the fall of the year. Trees infested in the fall usually begin fading by late May or June of the following year. On the basis of past field observations and limited research, it is advisable to plan future control projects for July or possibly early August. During this period, evidence of fading of infested trees would be visible. Scheduling a control operation after some fading has begun would not only greatly reduce spotting costs but would also assure greater success of the project.

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